

IN THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

1-41 (cancelled)

42.(new) A direction-agile antenna system for use in establishing and maintaining wireless data links, the system comprising:

an antenna capable of being selectively oriented to transmit or receive an electromagnetic signal in a plurality of selected directions; and

a controller coupled to the antenna and configured to transmit at least one polling request through the antenna, detect responses to the polling request determine a selected direction for the orientation of the antenna based on the responses to the polling request and transmit a direction control signal to the antenna indicating the selected direction for the antenna.

43.(new) The system of claim 42 wherein said antenna comprises a plurality of elements and at least one of the plurality of elements is configured to transmit an electromagnetic signal in a different direction than another of the elements.

44.(new) The system of claim 43 wherein at least one of the elements is configured to be activated while other elements are switched off to transmit the electromagnetic signal in the selected direction of transmission of the antenna.

45.(new) The system of claim 42, wherein the antenna comprises a plurality of elements and the controller is further configured to transmit the polling requests from all of the elements.

46.(new) The system of claim 42 wherein the controller comprises a transceiver.

47.(new) The system of claim 42 wherein the controller comprises circuitry which is integrated with a surface on which at least one of the elements is disposed.

48.(new) The system of claim 42 wherein the controller is further configured to scan the antenna in multiple directions and detect a response to the polling request during the scanning of the antenna.

49.(new) The system of claim 43 wherein at least some of the elements are arranged as a phased array.

50.(new) The system of claim 42 wherein said antenna comprises a plurality of elements that can be separately activated and at least one reflector.

51.(new) A method of improving a wireless communication link using a direction-agile antenna, the method comprising:

- transmitting at least one request from the direction-agile antenna;
- scanning the antenna beam of the direction-agile antenna in multiple directions;
- detecting responses to the request;
- determining a direction of the antenna beam of the direction-agile antenna based on the detected responses; and
- transmitting or receiving a signal from the direction-agile antenna in the determined direction.

52.(new) The method of claim 51 wherein the direction-agile antenna comprises a plurality of elements and said at least one request is transmitted from all of the antenna elements of the direction-agile antenna.

53.(new) The method of claim 51 further comprising the step of selecting a scanning speed for said antenna which is different from the scanning speed of an additional antenna in said communication link.

54.(new) The method of claim 51 further comprising the step of selecting scanning angle increments for said antenna which are different from the scanning antenna increments of an additional antenna in said communication link.

55.(new) The method of claim 51 wherein scanning the antenna beam of the direction-agile antenna in multiple directions includes scanning in azimuth and elevation.

56.(new) The method of claim 51 wherein determining a direction of the antenna beam of the direction-agile antenna comprises:

detecting a beam pattern of a signal carrying a response to the request over the scanning of the direction-agile antenna.

57.(new) The method of claim 51, wherein determining the direction of the antenna beam of the direction-agile antenna comprises:

comparing one or more characteristics of a signal carrying a response to the request detected at different times during the scanning.

58.(new) The method of claim 51 further comprising:
monitoring characteristics of a signal received by the direction-agile antenna,

determining if the characteristics meet predetermined criteria, and
if the predetermined criteria are met, scanning the antenna beam of the direction-agile antenna in multiple directions.

59.(new) The method of claim 51 further comprising:
monitoring characteristics of a signal received by the direction-agile antenna as the direction of the antenna beam is changed and adjusting the direction of the antenna beam of the direction-agile antenna based upon the monitoring of the characteristics.

60.(new) The method of claim 51 further comprising:
if an expected signal is not received, scanning the antenna beam of the direction-agile antenna in multiple directions.

61.(new) The method of claim 51 wherein the direction-agile antenna has a plurality of antenna elements and scanning the antenna beam of the direction-agile antenna in multiple directions comprises shifting the phases of signals transmitted by different antenna elements of the direction-agile antenna.

62.(new) The method of claim 61 wherein transmitting at least one request from the direction-agile antenna comprises transmitting a request from all of the antenna elements.

63.(new) The method of claim 51 further comprising recording the determined direction for later use.

64.(new) The method of claim 51 wherein the request is a polling request and the responses are transmitted according to the I.E.E.E. 802.11 standard.

65.(new) The method of claim 51 wherein the step of scanning the antenna beam is carried out by first activating a first antenna element and reflector and then activating a second element and a reflector.

66.(new) A method for use in establishing and maintaining wireless communications using an antenna system with the capability to transmit and receive signals in a direction having a positive antenna gain and to vary that direction, the method comprising:

transmitting a communication from the antenna system;

electronically steering the antenna gain of the antenna system through multiple directions;

detecting a response signal to the communication while the antenna system is being steered through multiple directions;

selecting the direction of the antenna gain based upon at least one characteristic of the response signal received at different directions of the antenna gain; and

transmitting or receiving a signal from the antenna system in the selected direction.

AMENDMENT Continued
Serial No. 09/709,758

67.(new) A method of improving a wireless communication link using a direction-agile antenna, the method comprising:

- receiving at the direction-agile antenna requests from a device requesting a data link;
- scanning the direction-agile antenna in multiple directions;
- determining a direction for the gain of the direction-agile antenna based on the received requests; and
- transmitting or receiving a signal at the direction-agile antenna in the determined direction.

68.(new) The method of claim 67 wherein scanning the gain of the direction-agile antenna in multiple directions includes scanning in azimuth and elevation.

69.(new) The method of claim 67 wherein determining a direction for the gain of the direction-agile antenna comprises:

- detecting a beam pattern of the signal carrying the requests from a device requesting a data link.

70.(new) The method of claim 67, wherein determining a direction for the gain of the direction-agile antenna comprises:

- comparing characteristics of the signal carrying the requests from a device requesting a data link detected at different times during the scanning.

AMENDMENT Continued
Serial No. 09/709,758

71.(new) The method of claim 67 further comprising:
monitoring characteristics of a signal received by the direction-agile antenna.

72.(new) The method of claim 67 further comprising:
monitoring characteristics of a signal received by the direction-agile antenna as the direction of the antenna beam is changed.

73.(new) The method of claim 67 wherein the antenna has a plurality of antenna elements and scanning the gain of the direction-agile antenna in multiple directions comprises activating and switching off different antenna elements of the direction-agile antenna.

74.(new) The method of claim 67 wherein the antenna has a plurality of antenna elements and scanning the gain of the direction-agile antenna in multiple directions comprises shifting the phases of signals transmitted by different antenna elements of the direction-agile antenna.

75.(new) The method of claim 67 further comprising recording the determined direction for later use in communicating with the device.

76.(new) A direction-agile antenna system for use in establishing and maintaining wireless data links, the system comprising:

an antenna having a plurality of antenna elements arranged for use as a phased array capable of selectively transmitting or receiving an electromagnetic signal in a plurality of directions; and

a controller coupled to the antenna and configured to:

transmit polling requests through the antenna,

detect responses to the polling requests,

determine a selected direction of the antenna for transmitting or receiving based on the responses to the polling requests,

transmit a direction control signal to the antenna indicating the selected direction of the antenna.

77.(new) The system of claim 76 wherein the controller comprises circuitry which is integrated with a surface on which at least one of the elements is disposed.

78.(new) The system of claim 76 wherein the controller is further configured to scan the antenna in multiple directions and detect a beam pattern of a signal carrying a response to the polling requests over the scanning of the antenna.

79.(new) A direction-agile antenna system for use in establishing and maintaining wireless data links, the system comprising:

- an antenna capable of selectively transmitting or receiving an electromagnetic signal in a plurality of directions; and
- a controller coupled to the antenna and configured to:
 - receive via the antenna signals from a device requesting a data link,
 - send a signal to the antenna to cause it to orient its gain in multiple directions,

- determine a selected direction for the orientation of the gain of the antenna based on the requests received while the antenna was scanning, and

- transmit a direction control signal to the antenna indicating the selected direction for the orientation of the gain of the antenna.

80.(new) The system of claim 79 wherein said antenna comprises a plurality of elements and at least one of the plurality of elements is configured to transmit an electromagnetic signal in a different direction than another of the elements.

81.(new) The system of claim 80 wherein at least one of the elements is capable of being activated while other elements are switched off to transmit the electromagnetic signal in the selected direction of transmission of the antenna.